

We Claim:

1. A method for controlling valve operation of valves coupled to a cylinder of an internal combustion engine with a piston, the method comprising:

5 indicating potential interference between the piston and the valve;

selecting at least one of valve timing and valve lift based on a direction of valve timing change and valve lift change; and

10 in response to said indication, limiting said selected one of valve timing and valve lift to reduce said potential for interference.

2. The method recited in Claim 1 wherein said indication of potential interference is an indication of operation at 15 conditions where clearance between a piston and an intake valve is below a threshold value when the piston is at a top dead center position.

3. The method recited in Claim 1 wherein said indication 20 of potential interference is based on current operating conditions.

4. The method recited in Claim 3 wherein said current operating conditions include cam timing.

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5. The method recited in Claim 3 wherein said current operating conditions include valve lift.

30 6. The method recited in Claim 3 wherein said current operating conditions include compression ratio.

7. The method recited in Claim 6 wherein said compression ratio is a current compression ratio value of a variable compression ratio system.

5       8. The method recited in Claim 1 wherein said selecting is based on whether at least one of valve timing and valve lift are changing in a direction that reduces potential clearance.

10      9. The method recited in Claim 1 wherein said limiting said selected one of valve timing and valve lift includes limiting position of travel to a selected range.

15      10. The method recited in Claim 1 wherein said limiting said selected one of valve timing and valve lift includes limiting position of travel to a maximum value.

11. A method for controlling valve operation of valves coupled to a cylinder of an internal combustion engine with a piston, the method comprising:

20      indicating potential interference between the piston and the valve based on engine valve timing, valve lift, and compression ratio;

selecting at least one of valve timing and valve lift based on a direction of valve timing change and valve lift change; and  
25      in response to said indication, limiting said selected one of valve timing and valve lift to reduce said potential for interference.

12. The method recited in Claim 11 wherein said indication  
of potential interference is an indication of operation at  
conditions where clearance between a piston and an intake valve  
is below a threshold value when the piston is at a top dead  
5 center position.

13. The method recited in Claim 11 wherein said selecting  
is based on whether at least one of valve timing and valve lift  
are changing in a direction that reduces potential interference.

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14. The method recited in Claim 11 wherein said limiting  
said selected one of valve timing and valve lift includes  
limiting position of travel to a selected range.

15 15. The method recited in Claim 11 wherein said limiting  
said selected one of valve timing and valve lift includes  
limiting position of travel to a maximum value.

16. The method recited in Claim 11 further comprising  
20 adjusting compression ratio based on engine or vehicle operating  
conditions.

17. A computer storage medium having instructions encoded therein for controlling valve operation of valves coupled to a cylinder of an internal combustion engine with a piston, the engine in a powertrain in a vehicle on the road, said medium  
5 comprising:

code for indicating potential interference between the piston and the valve;

10 code for selecting at least one of valve timing and valve lift based on a direction of valve timing change and valve lift change; and

code for adjusting said selected one of valve timing and valve lift to reduce said potential for interference in response to said indication.

15 18. The system of claim 17 wherein said code for adjusting said selected one further comprises code for limiting a position of said selected one of valve timing and valve lift.

20 19. The system of claim 18 wherein said code for adjusting said selected one further comprises code for limiting a position and a rate of change of said selected one of valve timing and valve lift.

25 20. The system of claim 17 wherein said code for adjusting said selected one further comprises adjusting both said valve timing and valve lift.

21. The system of claim 17 wherein said code for adjusting is carried out during engine operation.

22. The system of claim 17 wherein said code for adjusting further comprising adjusting each of valve timing, valve lift, and compression ratio.

5        23. The system of claim 17 wherein further comprising code for adjusting engine torque to compensate for said adjusting said selected one.